



# CHEESE BITS

**W3CCX**  
CLUB MEMORIAL CALL

ARRL  
Affiliated  
Club



Volume LIX

August 2018

Number 8

PREZ

SEZ:

Well it's early August and with all the rain my grass hasn't browned out and is still growing. Is anybody tired of cutting the grass this year! I still cut my own – too cheap to get a landscaper in and besides, I do need the exercise.

Propagation has been good in recent months. The Sporadic E openings on 6 and openings on 2 have made things interesting. Many of the Packrats have used FT8 to extend the DX contacts even further. A big thanks to the Packrats who have posted their real time experiences on the reflector alerting those of us who haven't been watching the band conditions closely to get on and have fun too.

Talking about operating: the late Summer & Fall contests and Sprints are just starting. I especially like the Sprints since they are only 4 hours in length and are easier to fit in the family schedule. I'm not a CW operator but I have to admit it pays to sharpen your CW skills in preparation for the contests. A couple extra grid squares is easily doable if you use CW on the weak ones. You may not find that weak station on FT8 that you could work right this minute using CW.

Don't forget about the September VHF Contest. Look for members of the South Jersey Mountain Toppers ARC and Packrats operating from High Knob. This great location is over 2000 feet above sea level and not far from Peck's Pond in

the Poconos. They will be on all the bands from 6 meters through 10 GHz.

June was the White Elephant Sale at the QTH of Bruce WA3YUE. Bruce, El, Dave and others did a great job of keeping the auction flowing smoothly and keeping the evening fun. The temperature and humidity also co-operated this year. Hoagies, snacks, soda and beer were supplied by the club. I think I now have even more stuff in my basement than before.

Saturday, August 11th is the annual Packrat picnic which will be held at the QTH of Michael KB1JEY. Let Michael know soon if your coming. Michael has a new large grill to make those Hot Dogs and Hamburgers taste great. The corn on the cob will have been picked that day in Jersey by one of your fellow Packrats! This is an outing for the entire family. There will be lots of good food and conversation. Bring your significant other, the kids, a covered dish and your swim suit. If the weather doesn't co-operate, the rain date is August 12th.

A major event in September this year is right around the corner. The Packrat Mid-Atlantic VHF Conference starts Friday afternoon on the 28th with a special seminar. This is followed by a full day of presentations on Saturday and a special dinner speaker that evening. Come learn and talk with some of the folks who have done some very interesting work in vhf/uhf and Microwave bands. Rick, Phil and other Packrats have been hard at work putting this together. The lineup of speakers and topics look great.

Pack Rats **CHEESE BITS** is a monthly publication of the  
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**PACKRAT 222 MHz REPEATER - W3CCX/R**

222.98/224.58 MHz (PL 136.5) Hilltown, PA

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**PACKRAT BEACONS - W3CCX/B**

FM29jw Philadelphia, PA  
50.080 144.300 222.062 432.290 903.072 1296.264 **2304.043**  
3456.200 **5760.195** 10,368.034 MHz (as of 1/17, red = off the air)

**MONDAY / TUESDAY NIGHT NETS**

**VHF/UHF Monday:**

<u>TIME</u>	<u>FREQUENCY</u>	<u>NET CONTROL</u>
7:00 PM	224.58R MHz	WR3P FN20kb Ralph
7:30 PM	50.145 MHz	N3RG FM29ki Ray
8:00 PM	144.150 MHz	K3GNC FN20ja Jerome
8:30 PM	222.125 MHz	KB1JEY FN20je Michael
9:00 PM	432.110 MHz	WB2RVX FM29mt Mike

**Microwave Tuesday:**

7:30 Coordinate QSO's on 144.260 for all Microwave bands you'd like to work. Also setup Q's at w4dex.com/uhfqso or **Packrat Chat Page W3SZ.COM**  
Visit the Mt Airy VHF Radio Club at: [www.packratvhf.com](http://www.packratvhf.com) or [www.w3ccx.com](http://www.w3ccx.com)

And of course the Hospitality suite will be open serving your favorite snacks and beverages along with a table top swap Friday evening. Not to be forgotten is a Mini Fest on Sunday morning – weather permitting. Sign up is best done on the Packrat web site very soon. You can pay using PayPal or pay Dave at the next General Meeting. This event is not to be missed! Call the Hotel direct and soon for special room rates. Be sure to mention the Conference. The Conference hotel is next to the PARX Casino.



Don't forget to get on the weekly check-ins to the Nets. Why wait till the next contest to find out what needs fixing? It's time to plan that antenna upgrade or repair too. Again, fall is right around the corner. If you need a ground crew or other help, let it be known at the next meeting or on the Packrat forum.

Don't forget to work on your latest project. Have some fun, learn more. Build something!

**73, George KA3WXV**

# THE 2018 WHITE ELEPHANT SALE

The benches were set, the tables were ready for items and the light refreshments and coolers of drinks were filled. It was 7PM and the PA system was working and Packrats and friends of the club arrived to fill the setting at the QTH or WA3YUE in Collegeville PA for the annual club auction and sale of "Stuff" and a few sealed "White Elephants." At 7:30 KA3WXV ran a brief business meeting with introductions of all present, and then handed out the VHF Contest Rover Award plaques to NN3Q and K3WGR. W3GAD trudges in with a heavy unit that he could barely carry past the auctioneers table. Our auctioneer, K3JJZ, decides that this would be the first item up for sale—a 6m 400W SSPA with internal PS—Sold for \$70, a hot bargain. The action has started. Items went quickly as the evening progressed—a 900MHz LNA in a weatherproof box for \$15; A DC distribution system for \$30; an vintage Ameco 6&2 to the WA2OMY "museum." Three white elephants went for prices between \$10 and \$25, but none of the bid winners shouted, "Eureka!" with their contents.



Some estate items from NJ came to the auction, and the jokes started. There was a box of hand tools including a small vise and wire strippers, "No vice and three strippers..." Our auctioneer chides the audience, "Michael, you haven't bid for anything yet." K1DS replies, "I'm coaching him." WA3EHD adds, "He's waiting to have him bid on the items that K1DS brought." K3JJZ holds up an item and describes it as a filter of some sort. NE3I asks, "Does it prevent cancer from smoking?" K3JJZ is handed a box of round meters. He counts them up and finds there are 6 of them in the box of different sizes and capability. The crowd asks, "Does it do 6 meters?" And next, a vintage Eico grid-dip meter with its coils, carefully packed in a cigar box is shown to the audience. "Can it do 6-digit grids?" jokes another attendee. KB1JEY finally bids on a Radio Shack Volt-Ohm

meter. Not that he needed one, but it was for his test equipment collection. Next up for bid is an old resistor substitution box. Does it still work? "Michael, test it with your meter!" The laughs weren't over yet. K3JJZ chides NE3I, "That's your bid, don't bid against yourself," as he points to the next item up for bids, a cable TV tester. Someone yells out, "That was a hot item 40 years ago." Of course, K3JJZ adds, "So was I a hot item, 40 years ago." As the items came off the inspection table to the auction floor, a power amplifier for 384MHz was presented. Someone asks, "What's on 384?" The owner replies, "I don't know, but when I transmitted using it, they came and knocked on my



door!" Of course, the box of muffin fans brought up the "fan club" joke, and eventually almost everything was sold. A 900 MHz commercial cell rack of gear brought by K1DS was not sold and he was told to take it home. When he protested, WA2OMY came to his rescue and added it to his own collection.



The place was



cleared by 9:45PM and the Packrat reflector was filled with kudos to all for a great fun and profitable evening. Thanks to all who provided grist for the auction mill and for those who came with cash.

Our gratitude to WA3YUE and family who hosted the event and to our great auctioneer, K3JJZ and his helpers.

**73, Rick K1DS**



Tnx to K1DS for Pix

# KoBAK's CQ WW VHF Rove

With two vans unavailable for the CQ WW VHF contest weekend, I decided to use my late model Subaru WRX as the rover vehicle. Soon after buying the WRX I had a trailer hitch installed for just such an "emergency", and could use that for my tilt up mast system. Besides, **how many VHF rovers have a manual transmission and a turbo charger?**

The station was simple and low power, with an IC7100 (100w 6m, <50w 2m) and two horizontal "loop" antennas (bent dipoles). The radio is installed in a backpack with it's own battery, but I used a separate 60Ah lithium battery so I wouldn't worry about running low. I started with paper logging, but switched to an isolated laptop on Sunday ... sometimes I forgot to manually switch N1MM between bands because I'm so used to it following the radio.

There was no horizontal stabilizing parts for the antenna mast, so I didn't risk traveling at highway speeds with the mast up. And being my "nice" newer car, I didn't want to risk getting the interior too wet. This meant I'd have to be able to transport the antennas in the little rear passenger area and erect the antennas for each major stop, though I could travel a few slow miles if it wasn't raining (which I did between three close grids in Gap on Sunday).

I started the contest at Camelback, which is my default starting location. There were some hams at the top gravel area (where W3CCX sets up), but it turned out they were doing an APRS Appalachian Mountains relay thing, so we didn't interfere with each other. I got lots of questions from park visitors, a hazard of setting up in the regular parking lot instead of my usual gravel area.

Before the contest started, I talked to Andrea K2EZ/R for a radio check, and she said she was coming up there too. She parked in a different lot to reduce interference, and we made two contest contacts before she rushed off. On Sunday morning, I also contacted her from Gap ... **when she was in Illinois!**

I had a decent rate of contacts for the first hour, especially considering my modest station. As is usual, one of my first contacts on both bands was K2LIM; it's sad to think of them going off the air soon. Had a first-time 2m contact to relatively rare and mostly-water FN53 in Maine. Mary WA0CSL in ND was my longest contact from Camelback; I would contact her again on Sunday from FN10. I also had three contacts in FL.

After about 2 hours the contacts dried up. My usual pattern would be to drive to Hazleton to activate grids in that corner (FN11, FN10, FN20, FN21) and stay the night, but with rain on it's way to the area, I packed up and drove home, where it had been raining since 1pm. I was lucky the rain line didn't extend to Camelback till well after the contest started.

Sunday morning it looked like the rain would hold off in Gap for a while, so I headed to the Gap grid corner. There were only a few stations on the air (on SSB at least), but some were from the midwest on 6M, so

...K0BAK cont'd



that was exciting. The opening continued through the morning, as I drove the short distances from FN10 to FM19 to FM29.

I contacted 800-pound-gorilla rover AC0RA/R for the first (and possibly last) time while they were in Iowa. I had 3 QSOs altogether between their changed grids and mine. Got several other Iowa stations too, as well as other midwest states. Since I don't have a home VHF station, the possibility of enjoying a 6M opening only happens a few weekends a year for me, so it's a thrill.

10 minutes after packing up in FM29, there was tremendous downpour on my way back home on Rt. 30, so I was grateful that my weather app showed motion radar to warn me ahead of time. The rain was so heavy that I hydroplaned; it's an interesting sensation when you're suddenly **driving a boat without a rudder**.

Back home, I started the laundry and kept an eye on the radar. There was a rain respite in mid-afternoon, so I headed off to the local high spot at an intermediate school. I made only 5 contacts in an hour; apparently the 6m openings were done; though I was glad I was able to activate my home grid.

While I was talking to N2NT about moving from 2m to 6m, a township police officer pulled up. My last encounter with police at this same spot was, um, unpleasant, so I tensed up. But he was friendly and we talked about what I was doing and ham radio in general. Moments after I packed up, there was another downpour albeit less intense than in Gap. I'm hoping my next VHF rove will not be scheduled by weather conditions and not require transport in a tiny car.

**Grids activated:** FN21, FN10, FM19, FM29, FN20  
**Farthest 2m:** FN21hb to FN53at (K1HC), 540km (pretty good for <50w into a bent dipole)  
**Farthest 6m:** FN10xa to EN17gp (WA0CSL), 1912km  
**Shortest contact:** newish Packrat Lee K3SFX, 10km  
**States:** ND, MI, FL, IA, KS, AR, AL, TN, MO, IL, ME, NH, MA, CT, VA, MD, NY, DE, NJ, PA

Band	Mode	QSOs	Pts	Grd	Pt/Q
50	USB	43	43	25	1.0
144	USB	21	42	13	2.0
Total	Both	64	85	38	1.3
<b>Claimed Score : 3,230</b>					



# *Plans for WSJT-X Version 2.0*

We are well aware of the issues many have experienced when using WSJT modes in North American VHF contests. To summarize, there are two main problem areas:

- Decoding of messages that have two call signs followed by "R " and a 4-character grid, and the related auto-sequencing, depend on proper and **coordinated** setting of a checkbox at both stations.
- There is a crying need for transparent support of "/R" (Rover) call signs in all standard messages, during contests.

Here's some background information aimed at relative newcomers and casual users of WSJT, followed by a brief preview of program features we plan to make available in Version 2.0 of WSJT-X.

## **Contest Mode**

Standard JT-style messages (those used in all of the structured WSJT modes) have 71 information bits: two 28-bit call signs and a 15-bit grid locator. The 15-bit field can alternatively convey a signal report (with optional "R"), or "RRR", "RR73", or "73". One additional bit re-purposes the 71 bits to carry a 13-character free text message. In a 72-bit packet there are NO free bits available to insert "R " before a grid locator, or "/R" after a callsign.

The "NA VHF Contest" checkbox presently in WSJT-X is a stop-gap feature added in 2016 to the MSK144 mode, and later to FT8. These modes conventionally use 15-second T/R intervals and offer semi-automated message sequencing. NA VHF contests require the exchange of 4-character grid locators. Signal reports are permitted, but not required. Contesters wanted a way to send messages like "K1ABC W9XYZ R EN37", thereby increasing their QSO rates by eliminating some transmissions from the standard minimal-QSO sequence.

## **Rovers**

Rovers move from grid to grid and must append "/R" to their callsign during the contest. These hardworking folks definitely need some help if they are to use WSJT modes effectively.

All structured modes currently supported in WSJT-X permit messages like these:

```
CQ K1ABC/R FN41  
DE K1ABC/R 73
```

... but you can't use a second callsign in place of the "CQ" or "DE". Once again, there is no room for such information in a 72-bit packet.

Some time ago we created workarounds that enable QSOs using a "/R" callsign or an "R+grid" message fragment. But these capabilities are limited and necessarily somewhat clumsy. Users must understand what's possible and what's not, and they must be **careful about some necessary program settings**. Decoding "R+grid" messages requires ticking a checkbox, and if someone else sends you standard signal reports you need to uncheck the box or manually edit your messages. Also, for reasons explained in the WSJT-X User Guide, this feature cannot work well when world-wide propagation is possible -- as it has been recently on 6 meters.

All in all, it's not a happy situation -- especially when considering the typical presence of many casual



operators who happen upon a contest and just want to make a few QSOs.

Recently K9AN, G4WJS, and I have been developing enhanced versions of the MSK144 and FT8 protocols that extend the message payload to 77 bits. For a taste of what's to come, here's a brief list of things made possible by the extra bits:

1. NA VHF Contest operation with full support of grid exchanges and "/R" (Rover) call signs
2. EU VHF Contest operation with the exchange of 6-digit grids, QSO serial numbers, and "/P" (portable) call signs
3. ARRL Field Day operation with standard Field Day exchanges
4. ARRL RTTY Roundup operation with standard contest exchanges
5. Better and more user-friendly support for compound and nonstandard call signs
6. A special "telemetry" message format for exchange of arbitrary information up to 71 bits
7. The existing FT8 DXpedition mode will be supported, and a more powerful DXpedition mode may be offered as well.

All of these features work **seamlessly and automatically**. No "contest mode" checkboxes are needed. In most situations decoding sensitivity will be slightly better than at present for FT8; for MSK144 it will sometimes be about 0.5 dB worse. Occupied bandwidths will be the same as they are now, and false-decode rates will be significantly lower.

Much of the necessary programming is finished. Many of the new features have been tested on the air, and we find them to work well.

**Don't rush to download something** -- these capabilities are not yet publicly available. There is more testing and code optimization to do. With summer vacation plans, etc., our current plans call for a beta-testing period probably starting in mid to late September. A full release should then be possible a couple of months later.

In particular: we are planning to make WSJT-X Version 2.0 available in time for you to read its new documentation and practice using it before (for example) the ARRL RTTY Roundup, January 5-6, 2019, and the ARRL VHF Sweepstakes, January 19-21, 2019.

**THIS IS IMPORTANT: The new protocols cannot be backward compatible with the existing ones.** We will probably provide some temporary "bi-lingual" capability for FT8, but not for MSK144. It will be essential for users to upgrade to Version 2.0 in order to use the new features and communicate with others who have made the upgrade. We will provide plenty of advance notice about a transition interval and an essential "must upgrade by" date.

-- 73, Joe, K1JT

Find additional information at: [http://physics.princeton.edu/pulsar/k1jt/wsjt-x\\_v2.0.txt](http://physics.princeton.edu/pulsar/k1jt/wsjt-x_v2.0.txt)

# MUD 2018 Call for Papers

Microwave Update 2018  
Dayton, Ohio, October 11 – 14, 2018  
Holiday Inn, Fairborn, Ohio  
[www.microwaveupdate.org](http://www.microwaveupdate.org)

Microwave Update (MUD) is an international conference dedicated to microwave equipment design, construction, and operation. It is focused on, but not limited to, amateur radio on the microwave bands. The Midwest VHF/UHF Society is pleased to host this year's event. The conference will be held at the Holiday Inn, 2800 Presidential Drive, Fairborn, Ohio 45324.

Call for Presentations and Papers: The program committee is calling for papers and presentations on the technical and operational aspects of microwave amateur radio communications. Tell us about your latest project, design or operating adventures. Please e-mail your proposals, questions, and submissions to John Ackermann, N8UR, at [jra@febo.com](mailto:jra@febo.com). Don't wait until the beginning of September to let us know what you're planning!

Presentations selected for the technical program may be given in person or by proxy. Please send an abstract and expected duration no later than August 25, 2018 so that we can determine and announce the program agenda the following week. Ideally, send your draft presentation by the same date. We encourage presenters to submit a companion paper for publication in the proceedings book. This paper would ideally be text based and expand on the presentation slides, but a simple copy of the slides is also okay. Either way, this material must be received no later than September 1, 2018 to be included in the book. Additional material (presentation slides, schematics, source code, more text, background info, etc.) to be included on the proceedings CD must arrive no later than September 25, 2018. All conference attendees will receive a copy of the book and CD.

Full details, including suggested topics, paper guidelines, schedule, and hotel information can be found on the MUD website:  
[www.microwaveupdate.org](http://www.microwaveupdate.org).

**Registration is now open at the web site**

# Mid-Atlantic States VHF Conference Earlybird Registration Info

Have you registered yet as an earlybird?

Please register now at [Packratvhf.com](http://Packratvhf.com) and also reserve your room at the Holiday Inn

Fantastic Tentative speaker program below.

Free pizza lunch and snacks included on Saturday for registered attendees

## Friday Sept 28 Afternoon Seminar 2:00-5:00 PM

Roger Rehr W3SZ & Phil Theis K3TUF  
N1MM log for Beginners

## Friday eve 7P-11P Hospitality and tabletop selling

## Saturday Sept 29 8AM-5PM

Paul Sokoloff WA3GFZ A Compact Multiband Microwave Transverter

Joe Taylor K1JT FT8 and the Summer Es

Paul Andrews W2HRO New Patch Feed Construction Technique

Dan Marlow K2QM Restoration of the 60' Tiro's Dish and EME Activity

Michael Davis KB1JEY My Favorite Test Gear Comes from China

Alan Wolke W2AEW Mr. Philip Smith and his Chart are Your Friend

Paul Wade W1GHZ Cheap & Simple Transverters - New and Updates

Rick Rosen K1DS Single Yagi EME

Phil Theis K3TUF Tower Mounted Microwave Gear

Joe Horanzy AA3JH LASER Communicator Update

Bob Fischer W2SJ Did Murphy Help You Prepare for the VHF Contest?

## Saturday Eve Banquet and door prizes

Paul Shuch N6TX CQ Space: Building the Interstellar Beacon

## Sunday Morning 8A-10A

Mini outdoor tailgate

Questions? contact [rick1ds@hotmail.com](mailto:rick1ds@hotmail.com)



# MID-ATLANTIC STATES VHF CONFERENCE Sept 28-29-30 2018

ARRL Sanctioned

Hosted by the Mt Airy VHF Radio Club

Holiday Inn-Bensalem-Philadelphia

3327 Street Rd, Bensalem, PA

(215) 639-9100 Early Bird rooms \$105+tax

Register on-line NOW at [www.packratvhf.com](http://www.packratvhf.com)

Conference Early Bird\*\* Registration only \$40

Saturday Evening Early Bird Banquet \$40

**Additional Proceedings papers sought—send to [rick1ds@hotmail.com](mailto:rick1ds@hotmail.com)**

Friday Afternoon seminar “N1MM Log-Intro for Beginners”

Friday evening hospitality and table-top selling

Saturday conference presentations & auctions

Registration includes pizza lunch and snacks

Rohde & Schwarz Technical Testing Room

Saturday evening Banquet buffet dinner with door prizes\*

Sunday morning free outdoor mini-flea market

Tentative Speakers and topics:

**Friday Afternoon Seminar 2:00-5:00 PM**

Roger Rehr W3SZ N1MM Log: An Introduction for First Time Users

Phil Theis K3TUF

**Saturday 8AM-5PM**

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Phil Theis K3TUF Tower Mounted Microwave Gear

Joe Horanzy AA3JH LASER Communicator Update

Bob Fischer W2SJ Did Murphy Help You Prepare for the VHF Contest?

**Saturday eve banquet speaker**

Paul Shuch N6TX CQ Space: Building the Interstellar Beacon

details and updates [www.packratvhf.com](http://www.packratvhf.com) \*\* Early Bird price good through Sept 20.

\*You must be registered and paid for conference and banquet to be eligible for door prizes

# What's On 6 News

[Excerpted from **Chris W3CMP's** Monthly Column]

It's 7th July and here in the mid-Atlantic we are enjoying a respite from 32°C -35°C weather that we had for the preceding week. For a few days we are getting a preview of fall. My radio activity has been hit-and-miss; the regular DXpedition/work trip to Haiti was replaced by a trip to Paris, France to visit prospective in-laws and witness the marriage proposal to one of my daughters near the Eiffel Tower. Although there was no radio operation, the father-in-law to the bride to be is Michel, F5HTA, and we enjoyed a number of conversations about amateur radio. For me the highlight of the visit was a side trip to Normandy and the American Cemetery at Omaha Beach. It was utterly sobering.

It also appears there will be less demand for Haiti on 50MHz in the future. There is a rebirth in native six meter operation from HH. Jean-Robert HH2JR and Rick HH2MK have been active on six meters, and they are equipped for 70MHz operation as well. For me this is satisfying; the equipment and antennas delivered in past years are being used, and six meter signals from Haiti have become more common. As I sit here in the shack preparing WOS, I'm listening to 50.313MHz and the multitude of FT8 signals. From the time I get up, which is usually around 10:00z, .313 is full of tones. I can hear the meteor bursts as well as the QSB from signals on both even and odd sequences. It often sounds like Rick Nielsen tuning a guitar. Occasionally I flip to 50.110Mhz and there is **nothing**. It's quite a change from just a year ago.

The summer E season began in early May, and is continuing without any prolonged lapses in propagation. Activity has been high, in large part due to the use of FT8, and many new DXCC's have been heard or worked. The increased activity is reflected in the many reports I've received from around the world. During the last three months a number of six meter operators have reached significant milestones. Tac JA7QVI has earned his six meter Worked All States (WAS) award and Han has received his certificate recognizing his completion of the requirements for CQ Magazine's Worked All Zones (WAZ) award. In the U.S., Mario K2ZD has reached the DXCC milestone of two hundred DXCC worked. These achievements are extraordinary. There is a lot happening on six meters. Enjoy!

## June Solar Report to Six News

KH6/K6MIO 07/07/2018

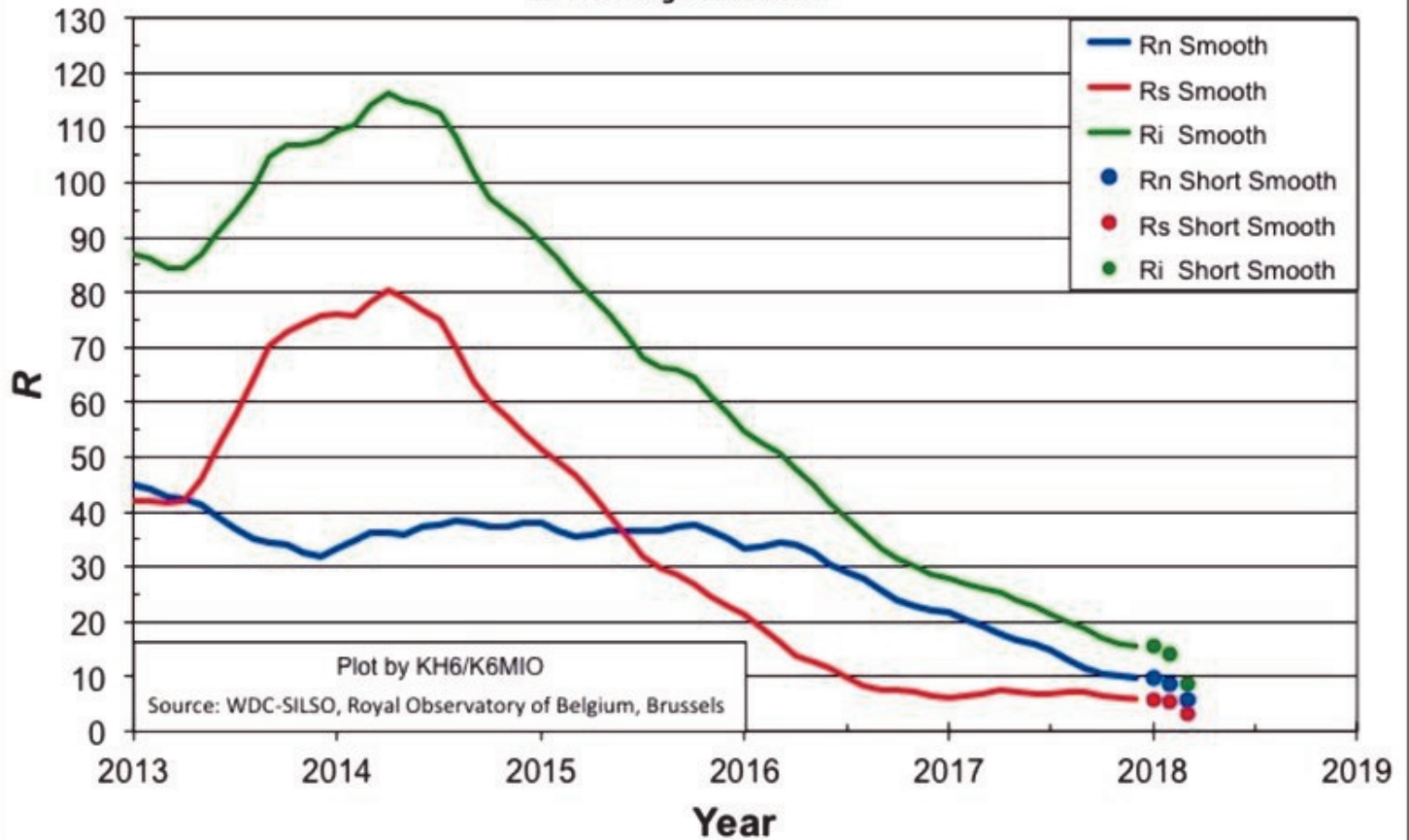
Solar Cycle 24

The Cycle is still slowly moving toward minimum. The figure below shows the SILSO\* solar indices for the 12-month smoothed data for the total solar index, Ri (in green), with a value of about 16. The short-smoothed data (green dots) for the following three months currently shows a value of about nine. Of course these last three numbers will change when more data arrive. The final three months' values, which are not shown, have lots of variability, as usual. The blue and red lines on the plot show the contributions of the Sun's northern and southern solar hemispheres, which add up to the total Ri value. Watching the daily numbers, they continue to show extended periods with no sunspot groups, which is what one would expect.

There are a wide variety of predictions about the actual date of final Cycle 24 minimum, and the following Cycle 25 maximum. Some predictions suggest minimum late this year, others suggest 2019, and others 2020. Time will tell. One authoritative prediction for the Cycle 25 solar maximum is early 2025, calls for an Rmax of around 135. If that turned out to be correct, then there would be some worthwhile F2 opportunities along in a few years. However, I must add that there is a very wide range of

## Solar Cycle 24

Ri and Hemispheric R  
Data through June 2018



Solar hemispheric WDC-SILSO activity indices for period 2013 to 2018

other prediction values, ranging from abysmal to past terrific. Of course, the above discussion really only applies to F2. In the long run, Sporadic E (Es) really doesn't depend much on the state of solar-cycle activity.

### Propagation

Just as an example of our Es capability, as I sit here in my ham shack in the middle of the Pacific (BK29), at the bottom of Cycle 24, in early July, my nearest continent is North America. At its shortest W6, that is about 4000 km. That's at least two hops of Es. The path to the US northeast coast W1 is about 8000 km, which is a distance of eight or nine Es hops. In the last two weeks, while actually doing other work here at home, I have had several dozen six meter Es QSOs all across North America - coast-to-coast, and several QSOs with JA, BA, etc. Lots of more serious folks in North America working even longer paths to the JA environs, some exceeding 10000 km. FT8 is great. 73 es DX, Jim

\* Source: WDC-SILSO, Royal Observatory of Belgium, Brussels

# VK7MO Roving 3 cm EME Grid Tour of Queensland Australia

[Sent to Cheese Bits by Packrat Al Katz K2UYH]

A total of 23 new grid locators were activated between 20 May and 26 June as shown on OK1KIRs web Map at Fig 1 and outlined in Black. QG62 outlined in Red had been previously activated but was again activated for a demonstration of portable EME at the Wireless institute of Australia Annual General Meeting. A key achievement was the activation of QH19 (Fig 2), the most Northerly grid in Australia, which involved a round trip of some 1400 km on mainly rough dirt, and much of the time badly corrugated, roads. Typically around 6 stations completed QSOs at each grid. Stations who participated were W5LUA, VK3NX, UR5LX, OK1KIR, OK2AQ, OK1DFC, OK1CA, HB9Q, OZ1LPR, G3WDG, HA/G3WDG, and UN6PD. A total of 140 QSOs were completed. A difficult issue was to operate both Moon Rise to North America and MS to Europe and to find accommodation at each site with suitable take-offs. Nevertheless all stations that were available were worked at each grid. In some cases the only suitable accommodation meant sleeping in the car.

VK7MO used a new portable system based on a 90 watt SSPA and a 1.13 meter dish with linear Horizontal polarization. All operations were with the QRA64-D mode in WSJT-X with CFOM or Constant Frequency On the Moon. A big advantage of CFOM is that all stations can tune to the same frequency and copy all activity without retuning. The smallest stations worked were OK2AQ, 1.20 meter dish and 40 watts, HA/G3WDG, 1.2 metre dish and 50 watts and UR5LX, 2.4 meter dish and 20 watts. These three small stations completed under even poor conditions of libration spreading over 100 Hz and Lunar degradation up to 1.5 dB. From

these tests it is concluded that 2 portable stations using 1.2 meter or 4 foot dishes and 50 watts can reliably work each other under even the worst conditions of spreading and lunar degradation, providing one of the stations can adjust polarization to correct for spatial offset. While some may argue that the solution is

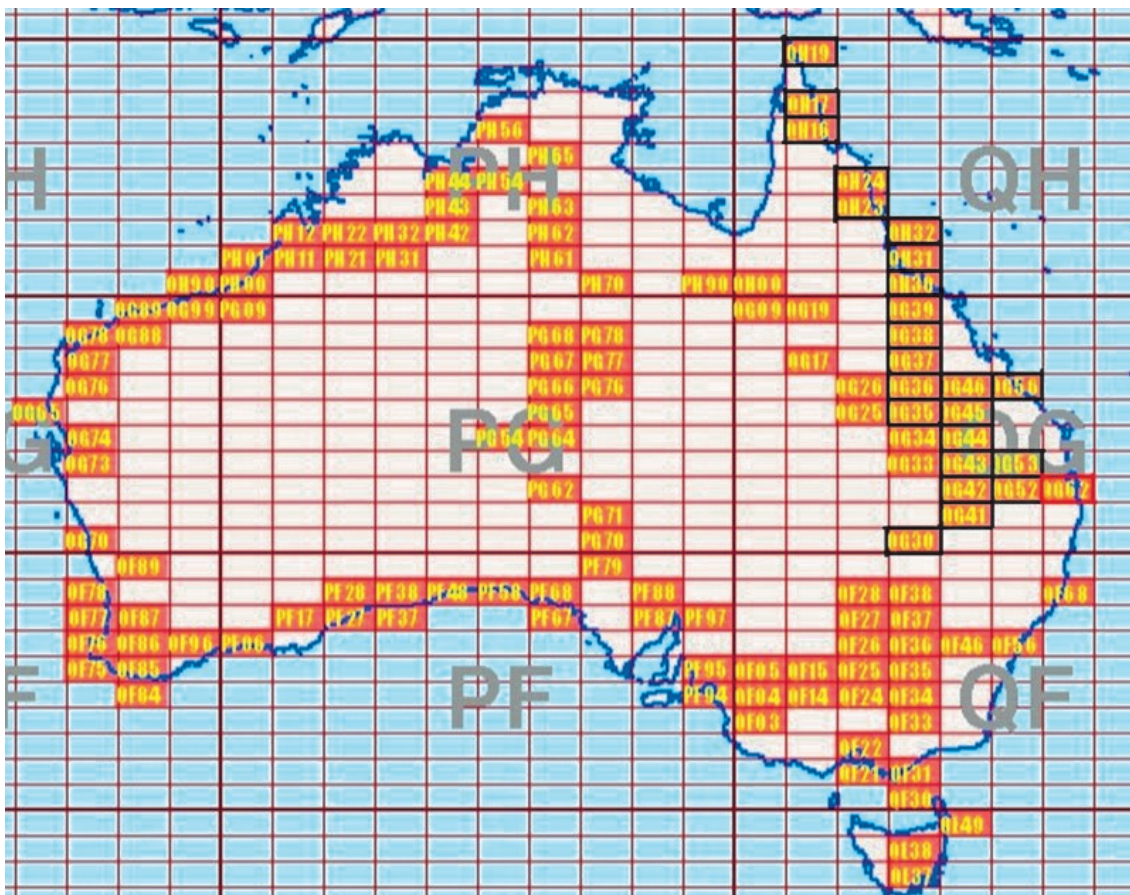


Fig 1: OK1KIRs Web Map showing 3 cm Digital EME QSOs in VK with the new grids outlined in Black

circular polarization there a good reasons for small 3 cm EME stations to use linear polarization. These include less blockage of small dishes to switch from clockwise to anticlockwise circular, the fact that small portable stations are also used for terrestrial and, as G3WDG has noted, there is a performance advantage of around 1 dB.



Fig 2: Operating Location at QH19, the most Northerly Grid locator on the Australian mainland – but see the warning at Fig 3 just 20 meters from this spot. It was necessary to operate this close to the water to get a good take-off to both Moon Rise and Moon Set and to operate the dish manually in the dark.



Fig 3: Warning about operating close to the water at QH19.

## Pointing at the (Es) Cloud instead of the Station

This is a delayed response to Griff NE3I's post from June 9 on the utility of sometimes "pointing at the cloud" instead of pointing directly at the station you are trying to work when 6M Es is open.

If you want to play around with pointing when 6 is open because you are not hearing/working what some folks around you are and you think maybe you are missing the cloud, one option is to use the MUF maps at DXMaps.com to see where the Es clouds are and try pointing towards the maximum MUF rather than in the direct-path direction. As a bonus, if you are logged in you can click on the MUF you want to point at and your azimuth to that location (and its distance from you) will pop up.

Link for map of MUFs:

<https://www.dxmaps.com/spots/mapg.php?Lan=E&Frec=MUF&ML=M&HF=N>

Then click on "World" or "NA" or whatever you want. The "NA" map does also show the western-most portion of Europe at the default magnification, at least on my systems.

DXMaps.com also has a warning service that will send you an email. The link for setting that up is here: <https://www.dxmaps.com/spots/warnings.php>

The warning for Sporadic E openings on 6M tells you the location of the best MUF, and what that MUF is when there is an opening.

There are lots of space-weather sites, but this one is easy to use. I keep it open in a tab, along with PSK-Reporter and WSPRNet. I keep WSPRNet open so that if the band "seems dead" I can look for spots and sort by ascending distance to see if there are any spots along the paths I am interested in. If there are spots along the desired path, then obviously there is propagation along that path even if no QSOs are seen on PSK-Reporter or DXMaps. This info will be shown on WSPRNet after you fill in the info on the following URL: <http://wspnnet.org/drupal/wspnnet/spotquery>

Just set the band, duration, sort-by (distance), click reverse, and click update.

The fun is in the journey, and we don't all need to take the same path. Take the road that is the most fun for you 73, **Roger W3SZ**

**Griff's** response was to paraphrase the saying: "Sometimes the most interesting discoveries are made when the scientist looks up and says, "That's funny."

### 3CX3000 Power Amplifier Project

Read about this ongoing project at <http://www.bunkerofdoom.com/3cx3000/index.html>  
To get an idea of the scale of this "junkbox" build, the plate transformer (5.6KV, 3.5A) weighs in at 400+ pounds and other components are of similar scale. It shows some fine craftsmanship and planning.

No disrespect intended, but I wouldn't want to be in the same room with this amplifier. Powered on or not. Fascinating to look at though. Just scary!

--W2BVH

### Whole Earth Weather Movies in Color

<http://rammb-slider.cira.colostate.edu>

The above website at Colorado State can bring up similar images on demand from the GOES-16 satellite.

As we run into tropo openings, perhaps it might be of interest to take a look at this view of the weather from high above.

Enjoy! **George NE2U**



# ***The Wayback Machine*** In CHEESE BITS, 50 Years Ago

Nibbles from June 1968. Vol. XI Nr. 8  
de Bert, K3IUV  
*(author's comments in italics)*

- **“Our Prez Sez”**. The new prez, Charlie, K3HSS thanked the members for his election, and discussed committee chairmanship appointments. He stated “I would like to see this tack become a pleasant one, by having enough volunteers so no one needs to do more than one job in a year.” “The next opportunity would be the annual picnic, scheduled for August 11, 1968.” *(A noble objective. Members, take heed, still a problem. When was the last time YOU volunteered for a job?)*
- **Constitution and By-Laws**. W3SAO, Frankie, continued his informative column, discussing sections of the Packrat Constitution and Bylaws. This month he listed the club Officers and Director Positions, and identified the quorum requirement of 5 of them. *(Do you know them? Do you know where your copy of the C and B is? If you do not have a copy, request one from the Board (or me.) Each member received (or should have) a copy of the current version.)*
- **ARRL Bulletin 176, 7/1/68**. The ARRL Intruder Watch is now in its 4<sup>th</sup> year of operation, and it has led to the removal of a number of intruders in the Ham bands (particularly 40-meters). Additional volunteers are needed, to spend two-hours a week logging calls of non-amateurs in the amateur bands. Contact ARRL Headquarters to

volunteer.

- **ARRL Bulletin 177, 7/11/68**. The Indonesian Government has begun issuing amateur licenses. The prefix will be YB. US and Canadian amateurs should avoid contacts, until the ITU Geneva has removed the ban on international communication by Indonesian operators ***(anybody remember what this was about?)***
- **ARRL Bulletin 178, 7/18/68**. The FCC has adopted rules providing for slow-scan TV in the HF and VHF amateur bands. This will be permitted in the Extra Class and Advanced class band segments. On HF, bandwidths shall not exceed that of a “properly adjusted” SSB signal. On 6-meters and above, the bandwidths shall not exceed that of a double sideband AM signal.
- **Book Review Net**. Conducted by member Paul, K3WEU. He reported that it will resume in late August. (He was on vacation in Canada, and reported “I caught many fish, the largest of which was a 19 pound Northern Pike which is now in my home freezer.” *(Packrats always had many other interests and hobbies.)*)
- **The Rat Corner**. An editorial article by WA3BIV, Carl. He spoke of “... the old days when gear was all homebrew. Relive those days by building gear for 220 or 432. All of the hams that you find on these bands use homebrew or converted surplus equipment. If you like to build, these bands are perfect. Antennas are small and easy to build.” *(Still good advice, but the bands are “higher up.”)*
- Hidden Transmitter Hunt. EI, K3JJZ penned one of his typically humorous

articles, titled "It Was Some Transmitter Hunt." (*That should give you a clue that all did not go well.*) With some signal reports showing a possible location in Southampton, the team stopped at the QTH of Bert, K3IUUV (that's me) to get better bearings. El reports "we almost found the transmitter!" For a few good laughs, reads the full article on the W3CCX website

- **Did You Know?** A few items extracted from this "newsy" section of the club paper. 1. Jim, WA3EHD is back on 6-meters. 2. Howard, K3EPB had an encounter with a power saw, and is in Doylestown Hospital. The saw is now for sale. 3. Packrat QSL cards now available. Price \$3.75 / 100. 4. WB2NOK, Bob has committed to writing an article titled "Why Ham Radio and Women are Incompatible". The article will be edited by his intended, Diane. 5. Mario, K3UJD (of Mario table fame) has promised to write an article on: Construction of a 432 converter." 6. Lastly, Fun is like Insurance. The older you get, the more it costs.
- **Swap Shoppe. By W3ZRR.** (*Always nostalgia.*) For sale by K3IPM, Stan. Pair Telrex 2-meter 11-element beams, 8/8 J-slot 220 beam, 8/8 J-slot 432 beam. Prices \$40, \$15 and \$15 respectively. (*No, Stan was not going off the air. He was always upgrading to better equipment, and selling the old "stuff".*) From K3GFF, Globe Hibander, Hallicrafters SX96, two Alliance rotors, and much more. "Must sell, all at one crack. Make offer."
- **Membership.** New member: WA3HVL,

Don Derosa. Applied for membership: WA3HEZ, Norm, and WA3JSR, Ben

- **Miscellany.** *Postage for this copy (from K3BPP, Walt,) was another nice 6-cent Roosevelt stamp. As in previous editions, many "folksy" comments about members, their families, and activities were included in this edition of Cheese Bits. If interested, or for more detail on the above items, visit our website ([www.W3CCX.COM](http://www.W3CCX.COM)) and read the full issue scanned by K3IUUV (me), and posted on the site. Remember, I have also posted the club Officers history, club Membership history, and Packrat Inventory (updated frequently) on the W3CCX website. These files are password protected, and only accessible to registered member. Have you registered?*



**Thirty, de K3IUUV**

## Hawaii!

Thanks to K6MIO being alert to my CQ, I was able to work Jim in Hawaii tonight. Grid BK29 using FT8 6M.

The last time I worked Jim was in the year 2000 when he was K6MIO/KH6. Signals peaked on the plus side tonight for about 15 minutes.

**K2LNS**

# Free SDR Books and Discounted SDR Rx/Tx System

ANALOG DEVICES. the leader of advanced SDR chips has purchased the rights to a brand new SDR book and they made tis book available on their site as a free pdf download, See this link for this book and at the bottom a link to another free SDR book that MATLAB is giving away.

<https://www.rtl-sdr.com/software-defined-radio-for-engineers-free-university-level-text-book-with-plutosdr-examples/>

While both books are loaded with SDR equations and matlab code, the new book that Analog Devices sponsored gives many examples using the ADALM-PLUTO Rx/Tx. This is not an HF Rx/Tx development system, but a VHF / UHF / microwave 70Mhz to 6GHz system (in fact to get it to go to the LOWEST frequency of 70MHz, you must first run a software patch!). Do not expect this to work on the VHF/ microwave ham bands out of the box. For me, it took a long time to get SDRRange operational (software was stable only in Linux. It also needs a Tx filter and PA added, etc.). If you are easily frustrated, wait until it gets sold as a working package.

If you are thinking of buying a ADALM-Pluto, check out this crazy (great) deal Arrow is offering... This ADALM-PLUTO development board for \$99.00 and if you buy anything from Arrow over \$50.00, you get a free RasPi B+ board! The RF and FPGA chips alone are many time more expensive than \$99.00.

This is a great time to be alive and experimenting with SDRs!

Details on the ADAL-PLUTO board:

<https://www.arrow.com/en/products/adalm-pluto/analog-devices> and getting a free B+ RasPi board: <https://www.arrow.com/en/products/raspberrypi3b/raspberry-pi-foundation>

73, Joe W2JEJ

## Inside The Desperate Fight To Keep Old TVs Alive

Behind a nondescript Manhattan storefront, Chi-Tien Lui is stockpiling objects many people wouldn't think twice about trashing: cathode ray tube televisions.

The full article is at <https://www.theverge.com/2018/2/6/16973914/tvs-crt-restoration-led-gaming-vintage> and was originally referenced from "Amateur Radio Weekly -- Issue 194" <http://www.amateurradio.com/amateur-radio-weekly-issue-194/>

# Events

For inclusion, please direct event notices to the editor.

**10 GHz and Up (Round 1) - Contest** - August 18-19, 2018. See <http://www.arrl.org/10-ghz-up> for details.

**6M Fall Sprint - Contest** - (2300Z August 25, 2018 to 0300Z August 26, 2018. Details at [http://svhfs.org/2018\\_SVHFS\\_FallSprints.pdf](http://svhfs.org/2018_SVHFS_FallSprints.pdf)

**September VHF - Contest** - September 8-10, 2018. See <http://www.arrl.org/september-vhf> for details.

**10 GHz and Up (Round 2) - Contest** - September 15-16, 2018. See <http://www.arrl.org/10-ghz-up> for details.

**2M Fall Sprint - Contest** - September 17, 2018, 7-11pm local. Details at [http://svhfs.org/2018\\_SVHFS\\_FallSprints.pdf](http://svhfs.org/2018_SVHFS_FallSprints.pdf)

**222MHz Fall Sprint - Contest** - September 25, 2018, 7-11pm local. Details at [http://svhfs.org/2018\\_SVHFS\\_FallSprints.pdf](http://svhfs.org/2018_SVHFS_FallSprints.pdf)

**EME 2.3 GHz and Up - Contest** - September 29-30, 2018. See <http://www.arrl.org/eme-contest> for details.

**432M Fall Sprint - Contest** - October 3, 2018, 7-11pm local. Details at [http://svhfs.org/2018\\_SVHFS\\_FallSprints.pdf](http://svhfs.org/2018_SVHFS_FallSprints.pdf)

**902 and Up Fall Sprint - Contest** - October 6, 2018, 8am-2pm local. Details at [http://svhfs.org/2018\\_SVHFS\\_FallSprints.pdf](http://svhfs.org/2018_SVHFS_FallSprints.pdf)

**Red Rose Repeater Assoc. - Hamfest** - October 6, 2018. Talmadge, PA. See <http://www.w3rrr.org/> for details

**EME 50 to 1296 (Round 1) - Contest** - October 27-28, 2018. See <http://www.arrl.org/eme-contest> for details.

**EME 50 to 1296 (Round 2) - Contest** - November 24-25, 2018. See <http://www.arrl.org/eme-contest> for details.

## Who said there's no SSB/CW contacts to be had in a VHF contest?

Call: AC0RA/R  
Operator(s): AC0RA KG5CCI  
Station: AC0RA/R  
Class: Rover HP

Band	QSOs	Mults
6:	606	350
2:	81	68
Tot:	687	418

Score = 321,442

Conditions for the contest were great on 6m overall. Saturday 6m opening seemed very wide spread but not many qsos to be had. Sunday when the band opened my best run was 190 qsos in 1 hour and 6 minutes reaching well over 200 rate for a while within that hour. 2m had no enhancement that I noticed and pretty low activity.

### Digi qso totals

36 on 6m msk144  
25 on 6m ft8  
17 on 2m msk144

Using /r in wsjtx is a major issue. We attempted many more ft8 qsos on 6m but couldn't complete do to /r. The contest mode issue is minor compared to the /r problem. Interestingly enough we had zero problems with contest mode or using /r on msk144. Obviously this is because guys working msk144 have a clue.

The rover consisted of 5 element 6m yagi at 20ft and 7 element 2m yagi at 18ft as well as a 3 element 6m yagi at 12ft and 3 element 2m yagi at 10ft. The smaller yagis were going to be used for in motion ops but we more or less gave up because ft8 was the only activity and it was far too frustrating to work ft8. Used an IC7300 for 6m and an IC910 for 2m with kw amps on each band. Lots and lots of improvements need to be made with the rover before next year's contest.

Also would like to note I didn't sleep the entire contest. I was either driving or operating. Dave slept a little bit while I drove but not much. Our goal going into contest was to give it our best effort to break the record which is about 220k. We did go qrt with 45 minutes left of the contest when KC0SKM/r pulled up and we talked till the end of contest.

I'd like to thanks everyone for the qsos and especially Dave, KG5CCI for joining me for this truly amazing contest. 73 Wyatt AC0RA

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## Complexity of the Sunspot Cycle(s)

This month's Scientific American has an interesting one-page article on sunspots. The 11-year cycle (the Schwabe cycle) is the one we tend to focus on, but there are 88 year cycles (the Gleissberg), occasional 200 year peaks (Suess-DeVries), and a 2,400 year (Hallstatt) cycle as well. The longer cycles look like modulation envelopes with the shorter cycles constrained within them.

It seems from the graphic that we are only a few hundred years off the low of the 2,400 year cycle as well as suffering the bottom of the 11 year. The last peak of the 2,400 year looks like it was at about the year 300 CE (a/k/a AD). So the next Hallstatt peak should be due in around 600 years, if I am interpolating from the graphics correctly. I should probably replace all the coax by then.

The article is non-technical but visually striking. See <https://www.scientificamerican.com/article/the-sunspot-cycle-is-more-intricate-than-previously-thought/>

Ted, KN1CBR

[Originally posted on the Elecraft Reflector]

## Joel Knoblock W3RFC

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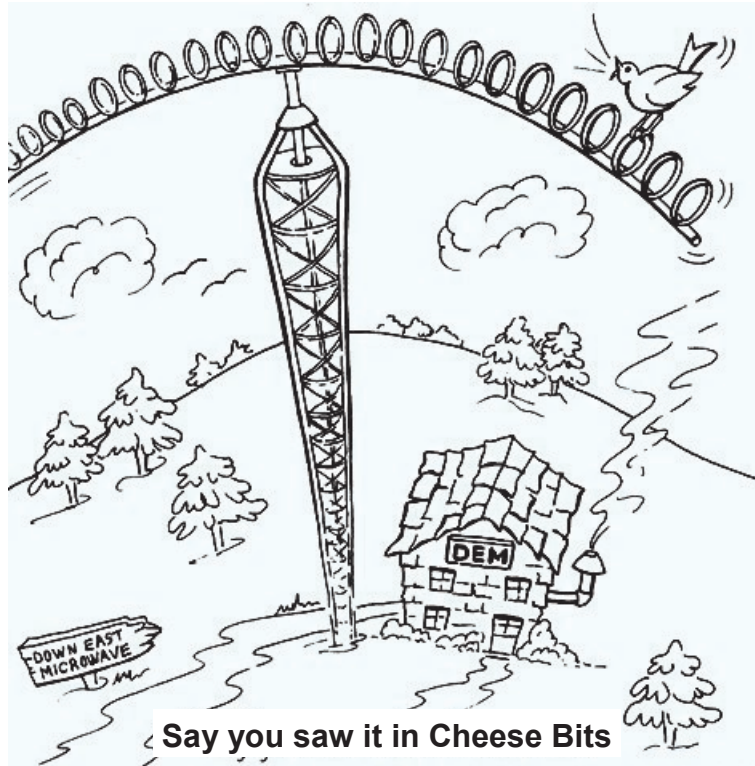
**Heads UP:** Look for a great multi-part article in Cheese Bits from Roger W3SZ on Phase Noise, starting some time this fall (after the VHF Conference)!

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